

Atty Dkt. No.: LIFE-078
USSN: 10/020,169

REMARKS

FORMAL MATTERS:

Claims 1-25 and 28 were examined. Claims 26 and 27 were withdrawn from consideration in response to an election of claims. Claims 1-15, 17, 20-25 and 28 were rejected. Claims 16, 18, 19 and 25 were objected to but indicated to be allowable if rewritten in independent form. Applicant thanks the Examiner for this indication of allowability.

By this Amendment, claims 26 and 27 are cancelled without prejudice and claim 29 has been added. Support for newly added claim 29 is found throughout the specification and in the original claims. Accordingly, no new matter has been added.

Claims 1-25, 28 and 29 are pending after entry of the amendments set forth herein.

REJECTIONS UNDER §103(a)

Claims 1-3, 7-9, 12, 13, 20, 21, 23, 24 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kovacs et al. (U.S. Pat. No. 6,051,422) in view of Min et al. (Measurement 27 (2000), pp. 21-28). The Examiner states that, with respect to claims 1, 9, 20 and 28, Kovacs et al. disclose a sine wave generator coupled to a biosensor and a current-to-voltage (I/V) converter coupled to an output of the biosensor. The Examiner notes that Kovacs et al. do not disclose the other elements of these claims but that those elements are disclosed by Min et al. (see p. 4 of the Office Action). The Examiner contends that, given the teaching of Min, one skilled in the art would have readily recognized the desirability and advantages of modifying Kovacs by employing the features disclosed by Min.

Applicant respectfully disagrees. It is well settled that if the claims are to be rejected over a combination of references, there must be some suggestion or teaching in the references that leads to their combination. *In re Napier*, 34 U.S.P.Q.2d 1782, 1784 (Fed. Cir. 1995). Many inventions are made from elements which are old in the art, however, it is the combination of these elements which constitutes the invention. Thus, to render the invention obvious, the prior art must suggest the combination, not merely the individual component elements. The Applicant also notes that under 35 U.S.C. §103, prior art references must be considered as a whole in any obviousness rejection; identification of individual elements within multiple separate references is not sufficient to support an obviousness rejection in the absence of evidence of a motivation to combine the cited elements. *In re*

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Geiger, 2 U.S.P.Q.2d 1276, 1278 (Fed. Cir. 1987). The Applicant respectfully submits that there is no motivation in any of the cited reference, or any references of record, to make the combination of components claimed in this application.

Kovacs et al. teach the monitoring of changes to cells held within a cell culture chamber upon addition of analyte where the chamber has an array of microelectrodes to which the cells adhere. Min et al. teach measuring electrical impedance between electrodes placed on a patient's body to obtain information related to the patient's respiration and cardiac output.

The combination of Kovacs et al. and Min et al. do not provide all of the elements of the claimed invention. Even if such combination does provide certain elements, there is no motivation to combine their teachings. The Kovacs et al system is intended for monitoring of changes to cells previously held within a cell culture. The Min et al. system is intended for monitoring a patient's vital signals. One of ordinary skill in the art practicing either system would not be inclined or motivated to look to the other. Accordingly, claims 1-3, 7-9, 12, 13, 20, 21, 23, 24 and 28 are not obvious over the art and Applicant requests withdrawal of the rejection and allowance of these claims.

Claims 4, 5, 6, 10, 11, 14, 15, 17 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kovacs et al. in view of Min et al. as applied to claims 1, 9, 20 and 21 and further in view of Kolle et al. (Measurement Science Technology, Vol. 9 (1998), pp. 510-517). With respect to these claims, the Examiner recognizes that the combined teaching of Kovacs et al. and Min et al. do not disclose the additional claim elements but that those elements are disclosed in Kolle et al. (see pp. 5 and 6 of the Office Action). The Examiner contends that given the teaching of Kolle et al., one skilled in the art would have readily recognized the desirability and advantages of modifying Kovacs et al. in view of Min et al. by employing the features of the synchronous demodulation technique for capacitance measurements as disclosed by Kolle et al.

For at least the reasons discussed above with respect to claims 1-3, 7-9, 12, 13, 20, 21, 23, 24 and 28, Applicant respectfully disagrees. Even if such combination does provide certain elements, there is no motivation to combine their teachings. The Kovacs et al system is intended for monitoring of changes to cells previously held within a cell culture. The Min et al. system is intended for monitoring a patient's vital signals. Kolle et al. teach the use of humidity sensors. One of ordinary skill in the art practicing either the Kovacs et al. system or the Min et al. system would not be inclined or motivated to look to the other or to Kolle et al. Accordingly, claims 4, 5, 6, 10, 11, 14, 15, 17 and 22 are not obvious over the art and Applicant requests withdrawal of the rejection and allowance of these claims.

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NEWLY ADDED CLAIM

Newly added claim 29 provides for an apparatus for measuring the effective capacitance across a biosensor cell having a first conductor connection and a second conductor connection, the biosensor cell configured to receive a sample having a volume, the apparatus comprising: a sine wave generator having an output for coupling to the first conductor connection of the biosensor cell, said sine wave generator producing an AC signal; a current-to-voltage (I/V) converter having an input for coupling to the second conductor connection of the biosensor cell and further having an output; a phase shifter having an input coupled to the output of said I/V converter and further having an output; a square wave generator producing a square wave synchronous with said AC signal; a synchronous demodulator having an output, a first input coupled to said phase shifter, and a second input coupled to said square wave generator; a low pass filter (LPF) having an input coupled to the output of said synchronous demodulator, said LPF producing a signal at an output proportional to an effective capacitance across the biosensor cell; an analog-to-digital (A/D) converter having an analog input coupled to the output of said LPF and further having a digital output, said A/D converter converting said signal proportional to the effective capacitance across the biosensor cell from analog to digital; and a processor coupled to the digital output of said A/D converter to process said digital signal proportional to the effective capacitance across the biosensor cell to derive the effective capacitance across the biosensor cell and to derive the volume of the sample based on the effective capacitance.

Despite the Examiner's contention (in para. 6 on p. 5 of the Office Action with respect to claim 23) that Kovacs et al. disclose an apparatus and a method comprising processing the signal proportional to the effective capacitance of the biosensor cell to determine the volume of the sample by the biosensor cell, Applicant finds no such disclosure. Kovacs et al. have no interest in or use for determining the volume of the sample deposited into the biosensor cell. Furthermore, none of the other prior art references disclose such either. Accordingly, for at least this reason, claim 29 is allowable and such action is respectfully requested.

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CONCLUSION

Applicant submits that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone the undersigned at the number provided.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-0815, order number LIFE-078.

Respectfully submitted,
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Date: 7/21/04

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